Please add new claim 78 as follows:

--78. (New) A method of passivating a multiplayer conductive structure, comprising:

layering a first conductive material;

introducing a selection of CF4, HCl, and $BCl_3$ gases to the first conductive material; and

layering a second conductive material over the first conductive material.--

REMARKS

Claims 43, 44, 76, and 77 along with newly added claim 78 are currently pending in the present application. This amendment is being filed as part of a request for continued examination under 37 C.F.R. § 1.114. In the final Office Action mailed August 28, 2001, the Examiner rejected claims 76 and 77 under the 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,204,203 B1 to Narwankar *et al.* ("Narwankar"). Claims 43 and 44 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Narwankar.

Applicant's invention exposes a conductive layer to an oxygen-inhibiting plasma or other gas, including nitrogen free gases, prior to the formation of the another layer or layers on the conductive layer to substantially reduce the association of oxygen with the conductive layer during formation of the other layer or layers. By reducing the amount of oxygen associated with the conductive layer, the electrical characteristics of a semiconductor device including the conductive layer are improved, as will be discussed in more detail below with reference to the disclosed embodiments of the invention. In order to help the Examiner appreciate certain distinctions between the pending claims and the subject matter of the applied reference, the disclosed embodiments of the invention will now be discussed in comparison to the applied reference. Specific distinctions between the pending claims and the applied references will be discussed after the discussion of the disclosed embodiments and the applied reference. This

discussion of the differences between the disclosed embodiments and applied reference does not define the scope or interpretation of any of the claims.

One embodiment of the present invention is discussed with reference to Figures 7-10 in which an interposing layer 52 such as a tungsten nitride layer 52 is formed between a conductive plug 46 formed in a via 44 and a conductive line material 48 formed in a trench or container 50. The tungsten nitride layer 52 enhances the electrical contact between the line material and the plug, promotes adhesion of the line material within the container 50, prevents or slows the diffusion of materials across the tungsten nitride layer boundary, or serves some other purpose. As previously described, the tungsten nitride layer 52 may associate with oxygen after it is formed and subsequent thermal processes may result in the formation of an oxide layer 54 between the tungsten nitride layer 52 and the line material 48. Because the oxide layer 54 is an insulator, this layer will adversely affect the electrical connection between the line material 48 and the plug 46. By exposing the tungsten nitride layer 52 to an oxygen-inhibiting agent or a reducing atmosphere prior to formation of the line material 48, the thickness of the oxide layer 54 is reduced to a thickness of less than 10 angstroms or entirely eliminated as illustrated respectively in Figures 9 and 10. Thus, in all embodiments a conductive layer is exposed to an oxygen-inhibiting agent or reducing atmosphere prior to another layer being formed on the conductive layer to thereby reduce an ability of the conductive material to associate with oxygen.

As described in the specification, the tungsten nitride layer 52 or other conductive layer may be treated in a plasma such as an $N_2$ and $H_2$ plasma, an $NH_3$ plasma, or an $N_2$ plasma. See page 6, lines 13-30 and page 7, lines 1-19. Furthermore, the conductive layer may be treated in a nitrogen-free gas, such as a plasma treatment including $H_2$ or other gases such as $B_2H_6$, $PH_3$, $CH_3SiH_3$, $(CH_3)_3Si\text{-}Si(CH_3)$, HMDS, $CF_4$, $CHF_3$, HCL, $BCl_3$, and silane $SiH_4$, and any combinations of these gases, as described on page 7, lines25-30, page 8, lines 1-16, and page 9, lines 1-12. As will be appreciated by those skilled in the art, the use of a plasma treatment enables energy of ions forming the plasma to be closely controlled to thereby more precisely treat the tungsten nitride layer as desired. Moreover, the other nitrogen-free gases provide beneficial treatment of the conductive layer when compared to nitriding of the layer by exposure to a nitrogen containing gas and the associated heat treatment.

Another embodiment of the present invention is illustrated in Figures 4 and 5 that depict an in-process semiconductor device. As mentioned in the specification, for the purposes

of explanation the in-process semiconductor device is assumed to be a capacitor in the process of being constructed. In Figure 4, the capacitor includes a first conductive layer or 24, which may be formed from hemispherical silicon grain (HSG), formed over a substrate 22, and a dielectric 26 formed on the first conductive layer. In the examples of Figures 4 and 5, the dielectric 26 is formed from tantalum pentoxide $Ta_2O_5$. A second conductive layer 28 formed from tungsten nitride $WN_x$ is then formed on the dielectric 26. The tungsten nitride layer 28 has a tendency to associate with oxygen, particularly if that layer is exposed to oxygen prior to a third conductive polysilicon layer 30 being formed on the tungsten nitride layer 28. During subsequent processing of the capacitor, the oxygen contained in the tungsten nitride layer 28 can combine with silicon from the polysilicon layer 30 to form an unwanted silicon dioxide layer 36 between the tungsten nitride layer 28 and the polysilicon layer 30. For example, a thermal process step such as the formation of a borophosphosilicate glass (BPSG) layer 34 over the polysilicon layer 30, which of course occurs after the formation of the polysilicon layer 30, may cause a reaction between the polysilicon layer 30 and the oxygen in the tungsten nitride layer 28 and thereby form the silicon dioxide layer 36.

Ideally, the HSG layer 24 forms a first plate of the capacitor, the tantalum pentoxide 26 forms the dielectric of the capacitor, and the tungsten nitride layer 28 and polysilicon layer 30 form the second plate of the capacitor. With the formation of silicon dioxide layer 36, however, the capacitor now includes a first capacitor corresponding to the HSG layer 24, tantalum pentoxide 26, and tungsten nitride layer 28, and a second capacitor in series with the first capacitor, with the second capacitor corresponding to the tungsten nitride layer 28, silicon dioxide layer 36, and polysilicon layer 30. These first and second capacitors connected in series have a combined capacitance that is less than that of the ideally formed capacitor. As will be understood by those skilled in the art, the thickness of the silicon dioxide layer 36 affects the value of the combined capacitance.

In the capacitor of Figure 4, the thickness of the silicon dioxide layer 36 is greatly reduced by exposing the tungsten nitride layer 28 to an oxygen-inhibiting agent prior to the formation of the polysilicon layer 30 to thereby greatly reduce the association of the tungsten nitride layer with oxygen. The silicon dioxide layer 36 in the embodiment of Figure 4 is less than 10 angstroms thick due to the oxygen-inhibiting agent, while in a conventional capacitor shown in Figure 3 the silicon dioxide layer 36 is about 10-40 angstroms thick. In the capacitor

of Figure 5, the exposure of the tungsten nitride layer 28 to the oxygen-inhibiting agent eliminates the formation of the silicon dioxide layer 36 altogether.

The oxygen-inhibiting agent may be an $N_2$ and $H_2$ plasma, with the tungsten nitride layer 28 ideally being exposed to this plasma prior to exposing tungsten nitride layer to an atmosphere associated with the formation of the polysilicon layer 30 or prior to exposing the tungsten nitride layer to oxygen. As described in the specification, it is believed the exposure of the tungsten nitride layer 28 to the $N_2$ and $H_2$ plasma or any of the other oxygen-inhibiting agents stuffs the tungsten nitride layer grain boundaries with nitrogen or otherwise passivates the tungsten nitride layer, making the bonds at the grain boundaries less active and less likely to associate with oxygen. It should be noted that even if the tungsten nitride layer 28 is exposed oxygen, the layer may thereafter be exposed to a reducing atmosphere, such as silane gas $SiH_4$, prior to formation of the polysilicon layer 30 to thereby reduce the oxygen content of the tungsten nitride layer 28 and reduce the thickness of any silicon dioxide layer 36 thereafter formed.

In another embodiment of the present invention discussed with reference to Figure 6, a first conductive layer such as a tungsten nitride layer 128 is deposited over a substrate 122 and a dielectric layer 126, such as a tantalum pentoxide layer, is deposited over the tungsten nitride layer. In this situation, the deposition of the tantalum pentoxide layer 126 may cause the tungsten nitride layer 128 to incorporate oxygen, reducing the capacitance of a capacitor including the tungsten nitride layer and tantalum pentoxide layer. Accordingly, in this embodiment of the invention, the tungsten nitride layer 128 is exposed to a $N_2$ and $H_2$ plasma or other oxygen-inhibiting agent before depositing the tantalum pentoxide layer 126. As previously described, the $N_2$ and $H_2$ plasma passivates the tungsten nitride layer 128 to thereby prevent oxygen from being incorporated within the tungsten nitride layer.

The Narwankar patent discloses a method of forming a metal oxide dielectric film having a high dielectric constant for a metal insulator silicon capacitor. Figure 2a illustrates a substrate 200 including an epitaxial substrate 201 having a doped region 202 and a patterned interlayer dielectric 204. A bottom polysilicon capacitor electrode 206 is formed in contact with the doped region 202 and over the interlayer dielectric 204. In a first step, which corresponds to block 102 in flowchart 100 of Figure 1, the substrate 200 is nitridated to form a thin silicon nitride barrier layer 205 on the bottom electrode 206 as illustrated. Narwankar states the purpose

of the silicon nitride barrier layer 205 is to form an oxidation prevention barrier layer on the bottom polysilicon capacitor electrode 206 to prevent oxygen from penetrating grain boundaries of the electrode. See column 4, lines 38-47. The silicon nitride barrier layer 205 may be formed by exposing the substrate 200 to ammonia gas $NH_3$ or, alternatively, by exposing the substrate to highly reactive nitrogen atoms formed by disassociating $NH_3$ or $N_2$ gas with microwaves. See column 4 lines 58-67 and column 5, lines 1-12. The silicon nitride barrier layer 205 is then annealed in a forming gas $N_2/H_2$ ambient to form a high quality annealed silicon nitride layer 209 as shown in Figure 2b. As described in column 5, lines 53-61, other hydrogen containing ambients may be utilized to anneal the silicon nitride barrier layer 205, such as hydrogen $H_2$, or $H_2$ and argon Ar, or $H_2$ and helium He. Figures 2c-e illustrate the substrate 200 during various steps of the formation of the metal insulator silicon capacitor, and Figure 1 illustrates a flowchart depicting the process of fabricating the capacitor.

Narwankar neither discloses nor suggests treating the bottom polysilicon capacitor electrode 206 in an $N_2/H_2$, $N_2$, or $NH_3$ plasma. As described in column 5, lines 38-52, by heating and exposing the substrate 200 to hydrogen and nitrogen gases, defects such as pinholes in the silicon nitride film 205 are eliminated or substantially reduced to prevent oxygen from penetrating through the silicon nitride barrier layer and oxidizing the polysilicon electrode 206. In contrast, in the present invention the tungsten nitride layer 52 or other conductive layer is exposed to an $N_2/H_2$, $N_2$, and $NH_3$ plasma having ions of a specific energy to more precisely passivate the conductive layer as desired. Thus, no subsequent annealing is required. Narwankar only suggests exposing the conductive layer to hydrogen containing gases, with inherent defects being later repaired via annealing. Narwankar does not disclose treating a conductive layer in an $N_2/H_2$, $N_2$, and $NH_3$ plasma to thereby passivate the layer. Furthermore, Narwankar expressly states each annealing ambient must contain hydrogen (column 5, lines 53-61), and thus teaches away from the use of the nitrogen $N_2$ plasma and the $CF_4$, HCl, and $BCl_3$ gases.

Amended claim 43 recites a method of passivating a multiplayer conductive structure including layering a first conductive material, introducing a selection of N2/H2, N2, and NH3 plasma to the first conductive material, releasing nitrogen from the plasma with electromagnetic energy, and layering a second conductive material over the first conductive material. Narwankar neither discloses nor suggests passivating the first conductive material with

an $N_2/H_2$, $N_2$, or $NH_3$ plasma and releasing nitrogen from the plasma with electromagnetic energy. The combination of elements recited in claim 43 is therefore allowable, and dependent claim 44 is allowable for at least the same reasons as claim 43.

Amended claim 76 recites a method of passivating a multilayer conductive structure including layering a first conductive material, introducing $N_2$ plasma to the first conductive material, releasing nitrogen from the plasma with electromagnetic energy, and layering a second conductive material over the first conductive material.k Once again, Narwankar neither discloses nor suggests passivating the first conductive material in an $N_2$ plasma and releasing nitrogen from the plasma with electromagnetic energy. The combination of elements recited in claim 76 is therefore allowable.

Amended claim 77 recites a method of passivating a multilayer conductive structure including layering a first conductive material, introducing an $NH_3$ plasma to the first conductive material, releasing nitrogen from the plasma with electromagnetic energy, and layering a second conductive material over said first conductive material. Narwankar neither discloses nor suggests passivating the first conductive material in an $NH_3$ plasma and releasing nitrogen from the plasma with electromagnetic energy. The combination of elements recited in claim 76 is therefore allowable.

New claim 78 recites a method of passivating a multiplayer conductive structure including layering a first conductive material, introducing a selection of CF4, HCl, and BCl3 gases to the first conductive material, and layering a second conductive material over the first conductive material. As previously mentioned, Narwankar neither discloses nor suggests introducing a selection of CF4, HCl, and BCl3 gases to the first conductive material. The combination of elements recited in claim 78 is therefore allowable.

All pending claims are in condition for allowance, and favorable consideration and a Notice of Allowance are respectfully requested. The Examiner is requested to contact the undersigned at the number listed below for a telephone interview if, upon consideration of this amendment, the Examiner determines any pending claims are not in condition for allowance.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "**Version with Markings to Show Changes Made.**"

Respectfully submitted,
DORSEY & WHITNEY LLP

Paul F. Rusyn
Registration No. 42,118

PFR:asw

Enclosures:
Postcard
Check
Fee Transmittal Sheet (+ copy)
Request for Continued Examination (+ copy)
Revocation and Substitute Power of Attorney
General Authorization

1420 Fifth Avenue, Suite 3400
Seattle, Washington 98101-4010
(206) 903-8800 (telephone)
(206) 903-8820 (fax)
h:\ip\documents\clients\micron technology\1000\501082.13\501082.13 amend after final reject 1.116.doc

## VERSION WITH MARKINGS TO SHOW CHANGES MADE

**In the claims:**

Claims 43, 44, 76 and 77 have been amended as follows:

43. (Amended) A method of passivating a multiplayer conductive structure, comprising:

layering a first conductive material;

introducing a selection of $N_2/H_2$, $N_2$, and $NH_3$ plasma [gas] to said first conductive material;

releasing nitrogen from said [gas] plasma with electromagnetic energy; and

layering a second conductive material over said first conductive material.

44. (Amended) The method in claim 43, wherein said step of releasing nitrogen from said [gas] plasma with electromagnetic energy comprises directing ultraviolet light toward said gas.

76. (Amended) A method of passivating a multilayer conductive structure, comprising:

layering a first conductive material;

introducing $N_2$ [gas] plasma to said first conductive material;

releasing nitrogen from said [gas] plasma with electromagnetic energy; and

layering a second conductive material over said first conductive material.

77. (Amended) A method of passivating a multilayer conductive structure, comprising:

layering a first conductive material;

introducing $NH_3$ [gas] plasma to said first conductive material;

releasing nitrogen from said [gas] plasma with electromagnetic energy; and

layering a second conductive material over said first conductive material.

PATENT

I hereby certify that on the date specified below, this correspondence is being deposited with the United States Postal Service as first-class mail in an envelope addressed to Box RCE, Commissioner of Patents, Washington, DC 20231.

October 29, 2001
Date

Ayesha S. Wilks

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

| | | | |
|---|---|---|---|
| Applicant | : Vishnu K. Agarwal | Attorney Docket No.: | 501082.13 (98-0616.12) |
| Serial No. | : 09/652,968 | Group Art Unit | : 2815 |
| Filed | : August 31, 2000 | Examiner | : Jose R. Diaz |
| Title | : DEVICE AND METHOD FOR PROTECTING AGAINST OXIDATION OF A CONDUCTIVE LAYER IN SAID DEVICE | | |

**TRANSMITTAL FOR REVOCATION AND SUBSTITUTE POWER OF ATTORNEY**

Box RCE
Commissioner of Patents
Washington, D.C. 20231

Sir:

Transmitted herewith and attached hereto as Addendum A is a true and correct copy of the Revocation and Substitute Power of Attorney executed September 24, 2001, in the above-identified application. The above-identified application and its parent application are identified on Exhibit A.

Pursuant to 37 C.F.R. § 3.73(b), Michael L. Lynch, duly authorized designee of Assignee, has certified that the evidentiary documents have been reviewed, specifically the Assignment to MICRON TECHNOLOGY, INC., recorded under Reel 9611 / Frame 0494, and certified that to the best of his knowledge and belief, title is and remains in the name of the Assignee.

Respectfully submitted,
DORSEY & WHITNEY LLP

Paul F. Rusyn
Registration No. 42,118

Enclosures:
Addendum A
Exhibit A

1420 Fifth Avenue, Suite 3400
Seattle, Washington 98101-4010
(206) 903-8800 (telephone)
(206) 903-8200 (fax)

PATENT

**ADDENDUM A**

THE UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner of Patents
Washington, DC 20231

REVOCATION AND SUBSTITUTE POWER OF ATTORNEY

Sir:

In the matter of the patent application(s) identified in Exhibit A attached hereto, I, MICHAEL L. LYNCH, declare that I am a duly authorized designee of Micron Technology, Inc. ("Micron"), the ASSIGNEE of the entire right, title and interest in and to said patent application(s). Documentary evidence of chain of title from the original owner(s) to ASSIGNEE has been or is concurrently being filed with and recorded by the United States Patent Office. The evidentiary documents referred to in the instant Revocation and Power of Attorney have been reviewed by the undersigned, and it is certified pursuant to 37 C.F.R. § 3.73 that, to the best of ASSIGNEE's knowledge and belief, title is held solely in and by Micron.

On behalf ASSIGNEE, I revoke all power of attorney heretofore given, and hereby appoint EDWARD W. BULCHIS, Reg. No. 26,847; PAUL T. MEIKLEJOHN, Reg. No. 26,569; GLENN P. RICKARDS, Reg. No. 29,428; DALE C. BARR, Reg. No. 40,498; KIMTON N. ENG, Reg. No. 43,605; BRIAN C. PARK, Reg. No. 45,519; MARK W. ROBERTS, Reg. No. 46,160; STEVEN H. ARTERBERRY, Reg. No. 46,314; PAUL F. RUSYN, Reg. No. 42,118; ANDREW F. PRATT, Reg. No. P-48,985; FRANK J. BOZZO, Reg. No. 36,756; JAMES ACKLEY, Reg. No. 45,695; RONALD BROWN, Reg. No. 29,016; DAVID BRUHN, Reg. No. 36,762; MARK CARLSON, Reg. No. 27,105; KEVIN CHAPPLE, Reg. No. 44,072; W. ROBINSON CLARK, Reg. No. 41,530; SHANE COLEMAN, Reg. No. 44,623; GREGORY DURBIN, Reg. No. 42,503; DANIEL FISHER, Reg. No. 34,162; DAVID FRONEK, Reg. No. 25,678; ANTHONY GANGEMI, Reg. No. 42,565; MICHAEL GILCHRIST, Reg. No. 40,619; THERESA HANKES, Reg. No. 45,501; JOHN HARROP, Reg. No. 41,817; BRAD HATTENBACH, Reg. No. 42,642; REED HEIMBECHER, Reg.

No. 36,353; CRAIG HEMENWAY, Reg. No. 44,759; STUART HEMPHILL, Reg. No. 28,084; MARK HOGGE, Reg. No. 31,622; JOHN KENNEDY, Reg. No. 42,717; JASON KRAUS, Reg. No. 42,765; BRIAN LAURENZO, Reg. No. 34,207; KENNETH LEVITT, Reg. No. 39,747; KURT LEYENDECKER, Reg. No. 42,799; SCOTT MARKS, Reg. No. 44,902; KEITH MONTGOMERY, Reg. No. 45,245; ALDO NOTO, Reg. No. 35,628; LEE OSMAN, Reg. No. 38,260; DEVAN PADMANABHAN, Reg. No. 38,262; JAMES PINTO, Reg. No. 40,774; GARY POLUMBUS, Reg. No. 25,364; SCOTT ROTHENBERGER, Reg. No. 41,277; LEONARD SANTISI, Reg. No. 24,135; ROBERT SCHEFFEL, Reg. No. 43,090; AMI SHAH, Reg. No. 41,143; MIRIAM SOHN, Reg. No. 35,368; HERMES SOYEZ, Reg. No. 45,852; GERALD SULLIVAN, Reg. No. 37,243; MARK THOMAS, Reg. No. 37,953; JON TUTTLE, Reg. No. 25,713; MEGAN VALENTINE, Reg. No. 47,149; LANCE VIETZKE, Reg. No. 36,708; SEAN WOODEN, Reg. No. 43,997; and the attorneys and agents associated with the firm of **DORSEY & WHITNEY LLP, Customer Number 27,076**, along with MICHAEL L. LYNCH, Reg. No. 30,871; CHARLES B. BRANTLEY, II, Reg. No. 38,086; KEVIN D. MARTIN, Reg. No. 37,882; and DAVID J. PAUL, Reg. No. 34,692, of MICRON TECHNOLOGY, INC., 8000 South Federal Way, Boise, Idaho 83716-9632, as its attorneys to transact all business in the Patent and Trademark Office connected therewith.

Please direct all future correspondence and telephone calls to:

Edward W. Bulchis, Esq.
Customer Number 27,076
DORSEY and WHITNEY LLP
U.S. Bank Centre, Suite 3400
1420 Fifth Avenue
Seattle, Washington 98101
(206)903-8800
(206)903-8820 facsimile.

ASSIGNEE:
Micron Technology, Inc.

9-25-01
Date

By _____
Michael L. Lynch
Chief Patent Counsel

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# Exhibit A

| Appl. No. | Atty Dkt # | Applicant | Filed | Title |
|---|---|---|---|---|
| 09/200,253 | 501082.01 (98-0616) | Vishnu K. Agarwal | 25-Nov.-98 | DEVICE AND METHOD FOR PROTECTING AGAINST OXIDATION OF A CONDUCTIVE LAYER IN SAID DEVICE |
| 09/652,994 | 501082.02 (98-0616.01) | Vishnu K. Agarwal | 31 Aug.-00 | DEVICE AND METHOD FOR PROTECTING AGAINST OXIDATION OF A CONDUCTIVE LAYER IN SAID DEVICE |
| 09/652,841 | 501082.03 (98-0616.02) | Vishnu K. Agarwal | 31 Aug.-00 | DEVICE AND METHOD FOR PROTECTING AGAINST OXIDATION OF A CONDUCTIVE LAYER IN SAID DEVICE |
| 09/652,993 | 501082.04 (98-0616.03) | Vishnu K. Agarwal | 31 Aug.-00 | DEVICE AND METHOD FOR PROTECTING AGAINST OXIDATION OF A CONDUCTIVE LAYER IN SAID DEVICE |
| 09/652,840 | 501082.05 (98-0616.04) | Vishnu K. Agarwal | 31 Aug.-00 | DEVICE AND METHOD FOR PROTECTING AGAINST OXIDATION OF A CONDUCTIVE LAYER IN SAID DEVICE |
| 09/652,842 | 501082.06 (98-0616.05) | Vishnu K. Agarwal | 31 Aug.-00 | DEVICE AND METHOD FOR PROTECTING AGAINST OXIDATION OF A CONDUCTIVE LAYER IN SAID DEVICE |
| 09/652,582 | 501082.07 (98-0616.06) | Vishnu K. Agarwal | 31 Aug.-00 | DEVICE AND METHOD FOR PROTECTING AGAINST OXIDATION OF A CONDUCTIVE LAYER IN SAID DEVICE |
| 09/652,583 | 501082.08 (98-0616.07) | Vishnu K. Agarwal | 31 Aug.-00 | DEVICE AND METHOD FOR PROTECTING AGAINST OXIDATION OF A CONDUCTIVE LAYER IN SAID DEVICE |
| 09/652,581 | 501082.09 (98-0616.08) | Vishnu K. Agarwal | 31 Aug.-00 | DEVICE AND METHOD FOR PROTECTING AGAINST OXIDATION OF A CONDUCTIVE LAYER IN SAID DEVICE |
| 09/652,714 | 501082.10 (98-0616.09) | Vishnu K. Agarwal | 31 Aug.-00 | DEVICE AND METHOD FOR PROTECTING AGAINST OXIDATION OF A CONDUCTIVE LAYER IN SAID DEVICE |
| 09/652,920 | 501082.11 (98-0616.10) | Vishnu K. Agarwal | 31 Aug.-00 | DEVICE AND METHOD FOR PROTECTING AGAINST OXIDATION OF A CONDUCTIVE LAYER IN SAID DEVICE |
| 09/654,027 | 501082.12 (98-0616.11) | Vishnu K. Agarwal | 31 Aug.-00 | DEVICE AND METHOD FOR PROTECTING AGAINST OXIDATION OF A CONDUCTIVE LAYER IN SAID DEVICE |
| 09/652,968 | 501082.13 (98-0616.12) | Vishnu K. Agarwal | 31 Aug.-00 | DEVICE AND METHOD FOR PROTECTING AGAINST OXIDATION OF A CONDUCTIVE LAYER IN SAID DEVICE |
| 09/652,579 | 501082.14 (98-0616.13) | Vishnu K. Agarwal | 31 Aug.-00 | DEVICE AND METHOD FOR PROTECTING AGAINST OXIDATION OF A CONDUCTIVE LAYER IN SAID DEVICE |
| 09/653,121 | 501082.15 (98-0616.14) | Vishnu K. Agarwal | 31 Aug.-00 | DEVICE AND METHOD FOR PROTECTING AGAINST OXIDATION OF A CONDUCTIVE LAYER IN SAID DEVICE |
| 09/652,580 | 501082.16 (98-0616.15) | Vishnu K. Agarwal | 31 Aug.-00 | DEVICE AND METHOD FOR PROTECTING AGAINST OXIDATION OF A CONDUCTIVE LAYER IN SAID DEVICE |
| Not Yet Assigned | 501082.17 | Vishnu K. Agarwal | 16 Oct.-01 | DEVICE AND METHOD FOR PROTECTING AGAINST OXIDATION OF A CONDUCTIVE LAYER IN SAID DEVICE |

PATENT

I hereby certify that on the date specified below, this correspondence is being deposited with the United States Postal Service as first-class mail in an envelope addressed to Box RCE, Commissioner of Patents, Washington, DC 20231.

October 29, 2001
Date

Ayesha S. Wilks

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

| | | | |
|---|---|---|---|
| Applicant | : Vishnu K. Agarwal | Attorney Docket No. | : 501082 .13 (98-0616.12) |
| Serial No. | : 09/652,968 | Group Art Unit | : 2815 |
| Filed | : August 31, 2000 | Examiner | : Jose R. Diaz |
| Title | : DEVICE AND METHOD FOR PROTECTING AGAINST OXIDATION OF A CONDUCTIVE LAYER IN SAID DEVICE | | |

**GENERAL AUTHORIZATION UNDER 37 C.F.R. § 1.136(a)(3)**

Box RCE
Commissioner of Patents
Washington, D.C. 20231

Sir:

With respect to the above-identified application, the Commissioner is authorized to treat any concurrent or future reply requiring a petition for an extension of time under 37 C.F.R. § 1.136(a)(3) for its timely submission as incorporating a petition therefor for the appropriate length of time. The Commissioner is also authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account No. 50-1266.

Respectfully submitted,
DORSEY & WHITNEY LLP

Paul F. Rusyn
Registration No. 42,118

PFR:asw
Enclosure:
Postcard

1420 Fifth Avenue, Suite 3400
Seattle, Washington 98101-4010
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H:\IP\Documents\Clients\Micron Technology\1000\501082.13\501082.13 gen auth.doc

501082.13 (98-0616.12)
PFR:asw

Box RCE
Commissioner of Patents
Washington, DC 20231

SENT: October 29, 2001
DUE: October 28, 2001 Sun

Kindly acknowledge receipt of the below-listed documents by placing your receiving stamp hereon and mailing:

**Check; Fee Transmittal Sheet (+ copy); Request for Continued Examination (RCE) under 37 C.F.R. § 1.114; Amendment in Response to Final Office Action; Revocation and Substitute Power of Attorney; General Authorization; in re: Vishnu K. Agarwal, USAN 09/652,968, filed August 31, 2000, for DEVICE AND METHOD FOR PROTECTING AGAINST OXIDATION OF A CONDUCTIVE LAYER IN SAID DEVICE.**

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DORSEY & WHITNEY LLP

# FEE TRANSMITTAL SHEET (FOR FY 2001)

| Complete if Known | |
|---|---|
| Application No. | 09/652,968 |
| Filing Date | August 31, 2000 |
| First Named Inventor | Vishnu K. Agarwal |
| Group Art Unit | 2815 |
| Examiner | Jose R. Diaz |
| Atty. Docket Number | 501082.13 (98-0616.12) |

## METHOD OF PAYMENT (Check One)

1. [X] The Commissioner is hereby authorized to charge any additional fee required under 37 C.F.R. §§ 1.16 and 1.17 and 1.136(a)(3) and credit any over payments to Deposit Account No.: 50-1266; Deposit Account Name: DORSEY & WHITNEY LLP

2. [X] Check Enclosed

## FEE CALCULATION

### 1. BASIC FILING FEE

| Large Entity Fee Code | Large Entity Fee ($) | Small Entity Fee Code | Small Entity Fee ($) | Fee Description |
|---|---|---|---|---|
| 101 | 740 | 201 | 370 | [] Utility Filing Fee |
| 106 | 330 | 206 | 165 | [] Design Filing Fee |
| 108 | 740 | 208 | 370 | [] Reissue Filing Fee |
| 114 | 160 | 214 | 80 | [] Provisional Filing Fee |

Subtotal (1) $ 0

### 2. EXTRA CLAIM FEES

| | Current Claims | | Prior | | Extra | | Fee | | Fee Paid |
|---|---|---|---|---|---|---|---|---|---|
| Total | 5 | - | 20 | = | 0 | x | $ | = | $ 0 |
| Ind. | 4 | - | 3 | = | 1 | x | $ 84 | = | $ 84 |
| Multiple Dependent Claims | | | | | | x | $ | = | $ |

Subtotal (2) $84

| Large Entity Fee Code | Large Entity Fee ($) | Small Entity Fee Code | Small Entity Fee ($) | Fee Description |
|---|---|---|---|---|
| 103 | 18 | 203 | 9 | Claims in excess of 20 |
| 102 | 84 | 202 | 42 | Independent claims in excess of 3 |
| 104 | 280 | 204 | 140 | Multiple dependent Claim |
| 109 | 80 | 209 | 40 | Reissue independent claims over original patent |
| 110 | 18 | 210 | 9 | Reissue claims in excess of 20 and over original patent |

## FEE CALCULATION (Continued)

### 3. ADDITIONAL FEES

| Large Entity Fee Code | Large Entity Fee ($) | Small Entity Fee Code | Small Entity Fee ($) | Fee Description | Fee paid |
|---|---|---|---|---|---|
| 105 | 130 | 205 | 65 | Surcharge - Late filing fee or oath | $ |
| 127 | 50 | 227 | 25 | Surcharge - late provisional filing fee or cover sheet | $ |
| 139 | 130 | 139 | 130 | Non-English specification | $ |
| 147 | 2,520 | 147 | 2,520 | For Filing a Request for Reexamination | $ |
| 112 | 300 | 112 | 300 | Publication (early or Republication) | $ |
| 115 | 110 | 215 | 55 | Extension for reply within first month | $ |
| 116 | 400 | 216 | 200 | Extension for reply within 2nd month | $ |
| 117 | 920 | 217 | 460 | Extension for reply within 3rd month | $ |
| 118 | 1,440 | 218 | 720 | Extension for reply within 4th month | $ |
| 128 | 1,960 | 228 | 980 | Extension for reply within 5th month | $ |
| 119 | 320 | 219 | 160 | Filing a brief in support of an appeal | $ |
| 120 | 280 | 220 | 140 | Request for oral hearing | $ |
| 121 | 110 | 221 | 55 | Terminal Disclaimer Fee | $ |
| 140 | 110 | 240 | 55 | Petition to revive – unavoidable | $ |
| 141 | 1,280 | 241 | 640 | Petition to revive – unintentional | $ |
| 142 | 1,280 | 242 | 640 | Utility/Reissue Issue fee (+ advance copies) | $ |
| 143 | 460 | 243 | 230 | Design issue fee (+ advance copies) | $ |
| 122 | 130 | 122 | 130 | Petitions to the Commissioner | $ |
| 123 | 50 | 223 | 50 | Petitions related to provisional applications | $ |
| 126 | 180 | 126 | 180 | Submission of IDS | $ |
| 581 | 40 | 581 | 40 | Recording each patent assignment per property (times number of properties) | $ |
| 579 | 740 | 279 | 370 | Request for Continued Examination (RCE) | $740 |
| Other fee (specify) | | | | | $ |

Subtotal (3) $740

**Total Amount of Payment: $824**

Submitted by:

| | | |
|---|---|---|
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| Signature: | | Date: 29 Oct 01 |

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